

Application Number 10/789322
Response to Office Action dated 10/26/2007

REMARKS

Applicant respectfully request favorable reconsideration and reexamination of this application. Revision to claim 1 is supported by, for example, page 6, line 31 to page 7, line 1 in the Specification. Revision to claim 5 is supported by, for example, page 22, lines 17-21 and page 23, lines 15-17 in the Specification. Claim 9 has been revised editorially. Claim 18 has been amended to include the features of claim 20. Claim 20 has been cancelled to track with the revision to claim 18. Claim 19 has been amended to include the features of claim 23. Claim 23 has been cancelled to track with the revision to claim 19. There is no new matter. Claims 1, 3-19, and 21-22 are pending.

Claim Rejections - 35 U.S.C. § 103

Claims 1 and 3 were rejected under 35 U.S.C. 103(a) as being unpatentable over JP 61-1292246 (hereafter JP'246) in view of Tomioka et al. (US 3532560). Applicants do not concede the correctness of the rejection.

Regarding claim 1, JP'246 does not teach a first spheroidizing annealing step performed on a carbide in a blank comprising ferrite and pearlite to make the pearlite finer to obtain a ferrite and pearlite structure wherein the pearlite is spheroidized as required in claim 1. Advantageously, this allows the drawing step to form finer austenite grains and to increase the spheroidizing rate to disperse the carbide. Tomioka et al. does not remedy this deficiency.

Further, the rejection concedes that JP'246 does not disclose the drawing ratio as claimed. The rejection states that Tomioka et al. discloses that the drawing ratio is less than 20%. However, Tomioka et al. teaches a drawing ratio used for obtaining a uniform fine grain sorbite structures (column 2, lines 69-71). Tomioka et al. does not teach or suggest that the process is applicable for any other structures. Tomioka et al. also states that "the tempered steel wire is stretched by an amount less than 20% reduction in area (usually about 13%)" (column 7, lines 61-65). Accordingly, Tomioka et al. teaches that the reduction in area is the objective goal of the drawing process. In contrast, claim 1 requires a drawing ratio applied on a ferrite and pearlite structure wherein the pearlite is spheroidized, advantageously forming finer austenite grains. Accordingly, Tomioka et al. teaches a step applicable to a different structure and for a different purpose than as required in claim 1.

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Further, even if the intermediate annealing step of JP'246 could be considered to be a second annealing step for manufacturing a billet, which Applicants are not conceding, it is improper to combine this step with teachings of Tomioka et al. The nature of the teaching in JP'246 is highly relevant and must be weighed in substance. It is improper to combine references where the references teach away from their combination. MPEP 2145; also see *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983) (The claimed catalyst which contained both iron and an alkali metal was not suggested by the combination of a reference which taught the interchangeability of antimony and alkali metal with the same beneficial result, combined with a reference expressly excluding antimony from, and adding iron to, a catalyst.).

JP '246 expressly excludes the intermediate annealing. In particular, JP '246 teaches that the manufacturing process of Fig. 2 is very complicated and requires equipment for each of the annealing, lubricating treatment and cold forging, resulting in an undesirable high cost of equipment for performing the integrated production of each process. JP '246 teaches that this is a problem to be overcome, wherein the intermediate annealing and lubricating treatment is to be "completely omitted" (page 230, in particular, second column, first paragraph, section titled "Problem to be Solved"). Accordingly, JP'246 teaches that the intermediate annealing is to be completely excluded.

Even further, Tomioka et al. explicitly states that their process eliminates the "time-consuming spherically annealing treatment so that there will be no possibility for the formation of deoxidized layers" that can lead to lower resistance to fatigue (column 4, lines 26-34).

Thus, JP '246 teaches away from having the intermediate annealing treatment and Tomioka et al. teaches against having a spherically annealing step. Therefore, it is improper to combine the step JP'246 expressly excludes with Tomioka et al. It is also improper to combine a drawing ratio of Tomioka et al. with a spherically annealing step which Tomioka et al. expressly excludes.

For at least the above reasons, JP'246 in view of Tomioka et al. does not teach all of the features of claim 1. Claim 1 is patentable over JP'246 in view of Tomioka et al. Applicants respectfully request a favorable reexamination and reconsideration of the claim.

Claim 3 is also patentable for at least the same reasons as claim 1 from which it depends. Further, the rejection concedes that the cutting step disclosed in JP'246 is after the second

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annealing, contrary to what is required in claim 3. However, the rejection erroneously states that it is improper to read a specific order of steps into method claims citing MPEP 2111.01 II.

It is "improper to read a specific order of steps into method claims where, as a matter of logic or grammar, the language of the method claims did not impose a specific order on the performance of the method steps" (MPEP 2111.01 II; also see *Altiris Inc. v. Symantec Corp.*, 318 F.3d 1363, 1371, 65 USPQ2d 1865, 1869-70 (Fed. Cir. 2003)). Accordingly, if a claim imposes a specific order on the performance of the method step, the order must be considered. Claim 3 imposes a specific order on the performance of the method step. Claim 3 does not require the order of steps be read in from the Specification. Claim 3 requires that the cutting step is between said first spheroidizing annealing step and said second spheroidizing annealing step. Accordingly, MPEP 2111.01 II is improperly applied against claim 3.

The specific order of the steps in claim 3 are not disclosed in JP'246 nor in Tomioka et al. Claim 3 is patentable over JP'246 in view of Tomioka et al. Applicants respectfully request a favorable reexamination and reconsideration of the claim.

Claim 4 was rejected under 35 U.S.C. 103(a) as being unpatentable over JP'246 in view of Tomioka et al. and further in view of JP 07-097656 (hereafter JP'656). JP'656 does not remedy the deficiencies of Tomioka et al. and JP'246 stated above. Accordingly, claim 4 should be allowed for at least the same reasons as claim 1 from which it depends. Applicants respectfully request a favorable reconsideration.

Claims 5 and 9 were rejected under 35 USC 103(a) as being unpatentable over JP'246 in view of Tomioka et al. and further in view of Bach et al. (US 4704166). Applicants respectfully disagree.

The rejection states that JP'246 in view of Tomioka et al. as applied to claims 1 and 3 is applicable to claim 5. The rejection does not address substantively how and where JP'246 in view of Tomioka et al. discloses all of the features of claim 5. Claim 5 is an independent claim. Accordingly, Applicants respectfully request further details as how the rejection as applied to claims 1 and 3 can be applicable to claim 5. Further, Applicants respectfully request how JP'246 in view of Tomioka et al. discloses a method of manufacturing a billet for cold forging, comprising steps of quenching a blank unloaded from a heating furnace to form a fine

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martensitic structure in a surface thereof, and then annealing the blank to convert the martensitic structure of the surface into a fine spheroidized structure comprising ferrite and cementite.

Further, the rejection states that Bach et al. discloses a method for producing a medium carbon steel rod comprising cooling the hot-rolled article quickly to form a surface layer of martensite (column 1, line 62 - column 2, line 30). The rejection states the motivation for forming a surface layer of martensite is stated in Bach et al. column 2, lines 30-32. However, this is taken out of context of Bach et al.'s teaching. In fact, Bach et al. teaches that the method of forming a surface layer of martensite is undesirable. Specifically, Bach et al. teaches that a formation of a surface layer of martensite "still does not solve the other problems mentioned - i.e. the difficulty of adapting the ramp to the entire range of products being made; also, the process introduces an additional disadvantage after the heat treatment because the recalcence which must be inhibited when the rod is spread on the conveyor is greater in proportion as the start-of-transformation temperature has been lowered" (column 2, lines 30-40). Accordingly, Bach et al. teaches expressly that this step results in an article having undesirable characteristics. Thus, Bach et al. expressly states that there is no motivation to use this step.

Further, Bach et al. does not teach or suggest any additional steps after forming a surface layer of martensite. Bach et al. did not recognize that further steps would make it desirable to have a surface layer of martensite in an article. In contrast, claim 5 requires an additional annealing step of the blank to convert the martensitic structure of the surface into a fine spheroidized structure comprising ferrite and cementite.

Further, JP'246 does not teach a blank including an intermediate layer comprising martensite, ferrite, and pearlite formed radially inwardly on the surface, and a central region comprising a mixed phase of ferrite and pearlite. Neither Tomioka et al. or Bach et al. remedy this deficiency.

Accordingly, JP'246 in view of Tomioka et al. in further in view of Bach et al. does not disclose all of the required features of claim 5. Therefore, claim 5 is patentable over JP'246 in view of Tomioka et al. in further in view of Bach et al. Claim 9 is also patentable for at least the same reasons as claim 5 from which it depends. Applicants respectfully request a favorable reconsideration of the claims.

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Claims 6-8 were rejected under 35 USC 103(a) as being unpatentable over JP'246 in view of Tomioka et al. and further in view of Bach et al. (US 4704166) and further in view of JP'656. JP'656 does not remedy the deficiencies of Bach et al., Tomioka et al., and JP'246 stated above. Accordingly, claims 6-8 should be allowed for at least the same reasons as claim 5 from which they depend. Applicants respectfully request a favorable reconsideration.

Claims 18 and 20 were rejected under 35 USC 103(a) as being unpatentable over JP'246 in view of JP'656 and further in view of Sakai et al. (US 5878323).

Claim 18 is revised to include all of the features of claim 20. Claim 20 is cancelled. Applicants do not concede the correctness of the rejection.

The rejection conceded that JP'246 and JP'656 fail to specify the aging step as claimed. However, the rejection erroneously stated that Sakai et al. discloses aging a forged connection rod and that it would have been obvious to one of ordinary skill in the art to add such a step to the teachings of JP'246 and JP'656.

The rejection states that an aging treatment as part of a thermal treatment applied to a plastically worked component is disclosed in Sakai et al. Even if Sakai et al. does state this general statement, which Applicants are not conceding, Sakai et al. does not teach treating a crankshaft at a temperature ranging from 250 to 350°C for 1 to 2.5 hours. The aging treatment taught by Sakai et al. is for bonding together two pieces of aluminum alloy at 240°C for 3 hours. One of ordinary skill in the art would not combine a step for bonding aluminum alloys with a method for cold-forming a carbon-steel alloy. Accordingly there is no motivation for combining Sakai et al. with JP'246 or JP'656. Even if there is motivation to combine the teaching of Sakai et al. with JP'246 and JP'656, which Applicants are not conceding, the temperature and time requirement taught by Sakai et al. is outside the claimed ranges. Thus, Sakai et al. does not remedy the deficiencies of JP'246 and JP'656. Accordingly, claim 18 is patentable over JP'246 in view of JP'656 and further in view of Sakai et al. Applicants respectfully request a favorable reexamination and reconsideration of the claim.

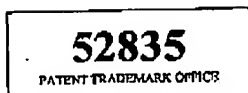
Claims 19 and 23 were rejected under 35 USC 103(a) as being unpatentable over JP'246 in view of Tomioka et al. and further in view of JP'656 and further in view of Sakai et al. (US 5878323).

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Claim 19 is revised to include all of the features of claim 23. Claim 23 is cancelled.
Applicants do not concede the correctness of the rejection.

As stated above in regard to claim 18, the specific age treatment process taught by Sakai et al. is inapplicable to a cold-formed blank made of carbon steel. Further, Sakai et al. teaches a process for bonding together two pieces of aluminum alloy at 240°C for 3 hours. In contrast, claim 19 requires an aging step of aging a crankshaft made of carbon steel, wherein the aging step includes treating the crankshaft at a temperature ranging from 250 to 350°C for 1 to 2.5 hours. Accordingly, Sakai et al. does not remedy the deficiencies of JP'246 in view of Tomioka et al. and further in view of JP'656. Therefore, Claim 19 is patentable over JP'246 in view of Tomioka et al. and further in view of JP'656 and further in view of Sakai et al. Applicants respectfully request a favorable reexamination and reconsideration of claim 19.

In view of the above, early issuance of a notice of allowance is solicited. Any questions regarding this communication can be directed to the undersigned attorney, Curtis B. Hamre, Reg. No. 29,165 at (612) 455-3802.



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Respectfully submitted,

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By:

A handwritten signature in dark ink, appearing to read 'Curtis B. Hamre'. The signature is written over a horizontal line.

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CBH/ajk/ljs